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ABSTRACT

A "thick" description of teaching is referred to as the uncovering of the meaning of what is being said or done by knowing the structure in which it is said or done. In this ethnographic study of teachers' experiences with microcomputers in their classrooms, George Kelly's (1955) personal construct theory was used to develop a clinical interview strategy based on the idea that how teachers deal with a change is dependent on how they construe classroom life. It is po ted that teachers have well established practices for conducting life in their classrooms which allow the business of the class to be done. Computer-based learning threatens those routines and causes routines to be re-appraised. How teachers use computers and how they construe their experience cannot be properly understocd without knowing the backdrop of everyday classroom routines and what they say about how a teacher interacts with the students in the context of the classroom. Using Kelly's method, two teachers were asked to construe classroom events involving computers and some insight was gained into the way they thought about their experiences with microcomputers. One teacher, at the elementary level, was just beginning to imagine how computers would work in the classroom. The other, at the secondary level, was already giving over some of the work of the curriculum to the computer. A report is presented of observations of the teachers' classrooms and of in-depth interviews with the teachers. (JD)

THROUGH THE LOOKING GLASS: TOWARDS THICKER DESCRIPTION OF TEACHING*

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THROUGH THE LOOKING GLASS: TOWARDS THICKER DESCRIPTION OF TEACHING

"Thick" Description

Clifford Geertz (1973) didn't invent the term "thick" description but he made it famous. In a lecture given at the University of Saskatchewan Gilbert Ryle (1971) drew a distinction between thinner and thicker description of actions. To do this he asks the question "What is le Penseur doing?" Le Penseur is a famous statue by Rodin very much in the act of cogitating. But what is the thinker really doing? asks Ryle. From a "thin" point of view the thinker is "saying things to himself." Ryle is critical of this view of thinking: "It is often supposed by philosophers and psychologists that thinking is saying things to oneself.... But [this view] fails because it stops just where it ought to begin.... What is the correct and thickest possible description of what [he] was trying for in murmuring those syllables?" (p. 487). But what else might he be doing? What more can be said?

That "more" is what constitutes a thicker description. It isn't that the thinker is not saying things to himself (although he might not be) but that describing what he is doing that way is only a beginning. The description can be thickened by reflecting upon his purposes in putting his chin on his hand, and by

considering his situation as a thinker. In short, we have to look carefully at all we know about the thinker and try to invent a coherent story that makes sense of what we know. We have to place the thinker in a situation which is intelligible to us and to him (could he actually think). We have to interpret his activity to know it.

Thick description is what we need for understanding teaching. What might this thick description be like? When people do meaningful things they depend upon a pre-existing structure to communicate their intention. This structure enables them to convey their meaning. Thick description of teaching is the uncovering of the meaning of what is being said (done) by knowing the structure in which it is said (done).

As Geertz points out, what most prevents us from understanding what people are up to "is not ignorance as to how cognition works as a lack of familiarity with the imaginative universe within which these acts are signs (p. 13) .... Doing ethnography is like trying to read (in the sense of "construct a reading of") a manuscript - foreign, faded, full of ellipses, incoherencies, suspicious emendations, and tendetious commentary, but written not in graph of sound but in transient examples of shaped behaviour" (p. 10).

Ethnography is no stranger to education. Yet, even so, there are not many ethnographies in the "thick description" sense of that method (Feiman-Nemser and Floden, 1986). That is a pity because ritualized practice is so much a part of the social life in schools. We think we understand what happens in classrooms

when if we think of it is a technical process based on the application of psychological principles. Once we see teaching as a thing itself -- a social thing -- it becomes much less clear that we know what is going on. It is only by thinking of teaching in instrumental terms (Harre, 1979) that we have any security that we know what is being "said", but that security is only apparent - much more is being said than what a focus only on learning as a technical problem would lead us to consider, and what that is, isn't clear at all.

This became clear to me as we have talked with teachers about their experiences with microcomputers (Olson and Eaton, 1986; Olson & Eaton, 1987; Olson, 1988). The teachers we talked to spoke of matters that went well beyond the rhetoric of computer-based learning to more fundamental issues to do with classroom life and the structure which sustains it. What these teachers told us had to be understood in relation to basic securities and insecurities at work in the school. Only by surfacing these issues could we begin to make sense of the way microcomputers were being used, or more exactly, of how teachers themselves interpreted their experience.

As Geertz (1973) says:

> Looking at the ordinary in places where it takes unaccustomed forms brings out not, as has so often been claimed, the arbitrariness of human behaviour but the degree to which its meaning varies according to the pattern of life by which it is lived (p. 14).

Not only did we find we had to probe the deeper structure of classroom life in order to understand the teachers experience, we had to appreciate that elementary and secondary teachers have different patterns of school life - that the culture of these

divisions of schooling are not the same. But we would not attend to this possibility if we were concerned about teaching only as a cognitive process, but only if we see a social process which manifests itself through its culture are sensitive to these nuances. We might think of our attending to the cognitive process as a thinner description of teaching, and to cultural processes as a thicker one. Thus we extend our description from one level to another and not offer two different versions of it.

Classroom Routine as Expressive Text

Before we look at texts taken from teacher's experience, we need to consider a fundamental unit of analysis - the classroom routine. It is through classroom routines that teachers express themselves. To understand what is being said in classrooms it is important to know what the routines are. These routines could justly be called rituals - cultural performances involving significant symbols.

We tend to think of routines and rituals as thoughtless or primitive - as "folkways" (Buchman, 1976). Yet how can such expressive acts be considered thoughtless if the expression of ideas is their very purpose? It is only by thinking that some other language is more thoughtful that such a judgement can be made - a scientific language. But why would one want to substitute scientific language for folk expression? Is it because we think folk expression is less rational? Or is it that we think that what has accumulated through tradition lacks warrant? Our prejudice towards tradition and folkways is yet another example of what Schon (1983) called technical

rationality. Part of the difficulty, we well, is that it isn't easy to find out what the rituals of schooling are. Geertz (1973) suggests that "folk" may offer visitors a different version of the ritual, and, in any event, where for 'visitors' [rituals] can only be: "aesthetically appreciated or scientifically dissected for participants, they are in addition . . . models for . . . believing" (p. 113-114).

To return to our focus on information technology, the way teachers talk about computers has to be seen against existing routines of the classroom. It is thus that the sense that they make for teachers can be further interpreted by the visitor. Classroom routines tell us about what people who live there believe in because they are expressive texts. Such texts help us appreciate what we see there and to make sense of it. Teachers have well established practices for conducting life in their classrooms which allow the business of the class to be done, which say something about who the teacher is and about the significance of what is done. Routines embody meaning. They express things. Routines are more complex than we think.

Computer based learning threatens those routines. The computer is a trojan horse in which lurks threatening new possibilities. It threatens to cause routines to be re-appraised. How teachers use computers and how they construe their experience cannot be properly understood without knowing the backdrop of everyday routines and what that can tell us.

Classroom routines are not what computers will replace, they are where computers must fit if they are to be useful to teachers. However making such a fit will jossle both teachers and software

designers.

What is a classroom routine? Consider the grade 5 class we watched giving group reports on a social studies project which were part of an integrated and partially computer based unit on Fire. Each group followed a careful sequence of steps; each group went through the same steps. This is a complex and patterned process in which students participate in a form of classroom life which allows for personal "glory", but minimizes risk of "loss of face".

Making "presentations" is a routine the teacher has developed which allows for the display of knowledge and for the receiving of public regard. Classroom life is made up of such routines. It is through these routines that the ethos of the classroom is created and experienced.

In the class presentations routine the teacher allows students to pursue their interests within a definite structure. There is a large degree of predictability in what the students study and how they make their presentation, allowing the teacher to know when things go wrong and to be able to put them right. The teacher is thus able to exert influence over the point and direction - the meaning - of classroom activity through using routines.

Routines reflect judgements teachers make about how to structure daily life in their classroom. They are routine only in that they recur, but they are not thoughtless or dull. Making sense of them is crucial to understanding the way teachers use resources like computers in the classroom. Yet we have tended

not to pay attention to teacher routines in thinking about how school practices change, except to think of them as barriers to change. Why do we view routines this negative way?

Teachers often have been accused of rather simplistic conceptions of what they do. Their "technology" has been seen to be weak and in need of bolstering especially by extracting solid prescriptions from the social sciences. Indeed some computer enthusiasts argue that teachers should step aside and let better technologies take over (Amarel, 1983). We should doubt such a diagnosis and prescription.

Dan Lortie (1975), for example, says that the "ethos of the profession is tilted against pedagogical inquiry." Teacher theories, he says, are simple and uncritical. But is their practice itself so bereft of intelligence? Is their know-how so deficient? This is another matter, and I think the answer is no. The practice is much more skillful and intelligent than how teachers talk about it might indicate.

What teachers know is embedded in their know-how. It is only because of what Ryle (1949) calls the "intellectualist legend" that we tend to assess the intelligence of performance on the basis of the quality of the supposed antecedent internal operations of planning. If we find that the operations are poorly articulated, we assume that the practice itself is also poor. Not so, says Ryle. These are two different things. He argues that contrary to the intellectualist legend, efficient practice precedes the theory of it, and intelligence is in the practice, not in the thinking about it. Abilities are played out in the practice itself - in the know how.

Teachers may not be able to give a well articulated, propositional account of their practice. But complex ideas about how to teach are in the familiar routines of the classroom. Not "thinking" about teaching does not stop teachers from efficient practice. While it may be a "good thing" for them to be able to articulate well what they are doing, that doesn't stop them doing it well. Indeed talk about routines is a "thin" representation of it.

The capacity to talk about teaching and do it are different, but related practices, and if we want to study what teachers know how to do we have to observe what they do. Teacher thinking in this sense is in the practice of teaching.

According to Polanyi (1958), comprehension of what another person is doing cannot be had through mere examination of the particulars of their behavior. We have to understand their behaviour as pointers towards the purposes which they serve, and in terms of those purposes. The meaning of what people do lies in the purposes served by those actions, which are not meaningful in themselves, but indicators of the purposes they serve which give them meaning. In themselves they mean nothing.

On this view, atomistic accounts of what teachers do seem bound to fail for lack of a context to make sense of them. Such a focus guarantees that we will not really understand the meaning of isolated acts. Only acts seen against a larger picture will do. Such a larger picture is given by the routines of teaching.

With this idea in mind, it is important to look beyond the instrumental uses of computers in classrooms; beyond their

"official" uses to their place in the affective life of the classroom. We have to consider the meaning of their use.

How does one, then, gain access to what teachers experience in using computers, and to the language they use to talk about their experiences? Such a phenomenolcgical problem requires that two important methodological points be attended to. People will have to be allowed to speak for themselves in their own language, and conditions will have to be established to allow their true feelings to emerge. With these considerations in mind, methodological guidance can be found in the work of George Kelly (1955). We used Kelly's personal construct theory to develop a clinical interview strategy based on the idea that how teachers deal with a change is dependent on how they construe classroom life. Kelly's technique allows the investigator to confront the teachers with a "picture" of their thinking about classroom activity, and particularly about relationships with the students.

As Shaw (1980) suggests, grid techniques can be used "to elicit the unique dimensions along which each individual classifies his world" (p. ix). In our use of Kelly's method teachers are asked to construe classroom events involving computers. By so doing we gain some insight into the way they think about their experience with microcomputers. (For a description of the method see Olson and Reid, (1982) and Olson and Eaton, 1986).

Kelly's grids are the means to achieve the "in-dwelling" of which Polanyi speaks. Kelly says: "If you do not know what is wrong with a person ask him, he may tell you. The clinician who asks such a question will have to be prepared to do a lot of

listening" (p. 322-3). Indeed Mischel (1964) suggests that Kelly's theory may be regarded as a guide to careful listening aimed at uncovering the reasons why people behave as they do. In the form of constructs which give significance to action because they are the rules of reasons which constitute that action.

Kelly's method enables people to appreciate what their actions mean and to discover what their actions mean. It is crucial to get behind the routines of classrooms to discover their significance. This is especially important if we are to understand the impact of computers because they have the potential to dislocate these routines. We used his method as part of the interviews we conducted with teachers.

With these comments about routines and our method of studying routines in mind, let us turn to the experience of two teachers: Mr. Coulomb (elementary) and Mrs. Melville (secondary). In each case we will consider only part of the picture of these teachers which has been given elsewhere in greater detail (Olson, 1988).

Through the Looking Glass? Computers in Classrooms

The New Machine in Mr. Coulomb's Class. Mr. Coulomb teaches at an elementary school in an outlying district near a small city. He is an experienced teacher interested in computers and especially LOGO. He used the software program we were field testing with his Grade 7 class for three weeks and at the end of that time we asked him to construe his classroom experience with computers.

Q How do you feel when a student offers the class computer expertise? How do you see your role while he's in the classroom?

A Where the [management] problem comes is that he's going to be doing things on the machine that I may not know how to do. I have to leave him on his own as far as the technical [aspect] is concerned. I have to watch it myself, manage it, and handle the situation. I think I'm going to have to learn some of that. That's the other side of the coin. I may be learning from the youngsters. Which is fine by me. It doesn't bother me at all. I don't feel threatened by it. It's just new. It's something new, the computer is new, and what you can do with it is new. The fact of having students who know far more about it because they have their own machine is a new element. It's not under existing procedures, because you're dealing with something that's new.

Q In what ways is the [student coming to your room] using the computer's to advantage?

A If you have someone there who can utilize it, and do more with it, an experienced person who knows something about it, then I'm utilizing what that machine can do. If I say no to him, you can't do that, then I am not using that machine to its fullest capability. If that information can come from a student, great!!! More power to [him/her].

How do we interpret what Mr. Coulomb has said? Mr. Coulomb has found that some of his students know more than he does about computers. He said that what the students are able to contribute isn't clear to him, and since it is important for him to keep up the momentum of his own teaching, how to manage the contribution of computer literate students is problematic.

While he wants the computer to be used to its maximum capability, he does not know what it's capabilities are - they are have something to do with the machine itself.

Mr. Coulomb, faces a technology whose possibilities are unknown. The rules for exploiting those possibilities are not established. How much will he need to know about computers, and what is it that he must know? For example, Mr. Coulomb is

concerned about his ability to use the equipment.

Q [what about] the teacher is removing a stuck disk from the disk drive?

A Yes. That is the same as the film projector breaks in the middle of the lesson. It's something you fix. If you can fix it, you go on. If you can't you stop, and go on with something else. It's more like a mechanical breakdown or something like any piece of audio-visual equipment I would use. I didn't see it as a very important item myself.

Q You didn't relate to it at all to classroom management or formal teaching. Does it call for particular procedures to be set up so as you know what to do in those circumstances, or is it not related to this at all?

A It was just a mechanical breakdown. Normally I don't have the students running the machinery. When something breaks, I say "O.K. We'll try to fix it", and if we can't I say, "O.K. guys we just have to leave it."

The stuck diskette is like a broken film projector. The "down" computer is the same as the broken film projector, and to be handled in the same way. If it could be fixed quickly then it would be; otherwise abandon the plan and go on with something else.

Mr. Coulomb saw the "down" computer as if it were just a broken machine or a lost book. He does not focus on the interaction between child and machine. What the program on the machine is doing isn't his concern. That isn't what is "down". It is the machine itself that is broken. He sees the program not as "teacher", but as an activity dependent on him in the same way a film he shows is. Were the program seen as "teacher", then the stuck diskette would have implications beyond ordinary machine malfunctions, but this does not seem to be the way Mr. Coulomb views the computer. He incorporates the machine into his ideas about other classroom aids pending, perhaps, a resolution of its

possibilities for teaching that are as yet unclear. He is not sure what manner of machine he is dealing with. Certainly he is not thinking in terms of "microworlds". The world that matters for hims is his own classroom.

Mr. Coulomb is concerned about instrumental matters. Can he be sure that work with the computer will have the same flow as other work he manages? How much effort will be needed to keep an eye on what is happening? Close supervision is required, and he may have to fix the machine. Being stuck, for him, means being faced with a familiar technical problem -- a broken machine. He doubts his capacity to manage computer based language. He worries that some students understand the machine in ways he doesn't and that it is not clear what students expect of him.

Mr. Coulomb's relationship to the machine is ritualized. The machine is something to be cared for by protecting it from students. It is like a fetish. If the machine is well cared for it can work hard on behalf of the class. He, himself, has to be prepared to work the machine properly. Thus the computer is a machine like other classroom machines (film and overhead projectors). It is a tool he can use to amplify (gain instructional advantage) in his classroom. Since the computer is a machine like the others, his and his students relationship to it are no different than other machines. The computer joins in with the other machines as something at Mr. Coulomb's disposal. He remains teacher; machine remains machine. No fantasies here about worlds beyond his classroom which can be approached through a machine.

How does he cope with this machine? Familiar routines are extended to make use of the computer and students are monitored as before. Rewards are distributed as usual and some children show off their special talents. Students make unacceptable demands and equipment still has to be fixed. But what do you do if the students are stuck and you can't help?

The programs may make it difficult for teachers to help their students because the "pages" of the computer are not on view. What if the computer is teaching something the teacher doesn't teach? What if the computer is asking for types of intellectual activity the teacher doesn't stress? What if the students ask the teacher for advice about a program thereby placing the teacher in a secondary role? Who is managing whom in this case? Who is doing the teaching? What does it mean to fully use the potential of the computer? What is the potential? Mr. Coulomb has not looked through the looking glass. Perhaps he is afraid of what he will find there.

Judging from what Mr. Coulomb said these questions are unresolved. At risk are the expressive elements of his work. How will he cope with the possibility that his students might not find him helpful, reliable and capable of unravelling knots and keep things smoothly running? Will the computer undermine his influence in the classroom?

His influence is fundamental (Olson,1982). Through his influence he shows students what is important to learn, as well as helping them learn it. He is able to do this because he knows how to diagnose learning difficulties and remedy them. His standing in the eyes of students depends on these abilities. In

order to be helpful he has to construe ambiguous classroom events quickly. Learning with computers makes it more difficult to do this, as we saw. There are four questions he is asking about his experience: "What are students learning from the computer and is it useful, and where are they at when they are working with computers and how can I help?"

His routines assume that these questions have an acceptable answer. It is these questions that are brought forward when he reflects on his experience with microcomputers. It is from understanding how he answers these questions that he could learn more about himself and his practice - more about the ethos (the moral universe) in which he works. But to do that he would have to look beyond the surface events of his practice. He would have to look through the looking glass.

Mr. Coulomb was only just beginning to imagine how computers would work in his classroom. Mrs. Melville, on the otherhand, was already giving over some of the work of the curriculum to the computer. She was beginning to see where this lead her. We join her class as they are doing OIL SEARCH.

The Spirit of Inquiry in Mrs. Melville's Class. We joined Mrs. Melville's class doing a unit on primary resources in a section on mining in the Canadian geography course using the OIL SEARCH program.

In OIL SEARCH students work in a group which starts with $900 capital to obtain information about the nature of the strata underlying its land, or to pay for drilling. The students can ask for a seismic study, a rock density analysis, or a core

sample which will give them the information about the oil potential of their land needed to decide to drill. They can, at any time, decide to sell their oil in order to fund further search and drilling activities. This was the second time she had done OIL SEARCH. She knew what to expect:

> In order to find the oil, they had to learn the concepts. They had to know different types of oil traps, and they had to know what kind of rock to look in. They learned that better than my sitting up there saying: "Okay this is an oil trap. This is what it looks like. Let's copy it down." They knew if they didn't know what it was they were going to miss where the oil was. It was competitive.

Mrs. Melville described how, on the first day, the noise level had been high - the students were excited about doing it because they had heard about it from the previous year's students. By the third lesson, which we taped, the change-overs were smooth and relatively quiet.

We saw one group get behind because they insisted in drilling for oil before they had sufficiently analyzed the rock where they planned to drill and they had still not hit oil. Mrs. Melville asked them what they had been doing and guided them towards more fruitful approaches to exploration.

The seatwork part of the program was important to her:

> You've got to have something else to keep them busy in between rather than just the computer program because it doesn't keep them busy. If they have something else that's related, a set of exercises of some sort then they keep themselves busy.
>
> They work quite well in groups. You always get the odd one. One kid was a little Hitler, literally. He was going to do it his way, but fortunately in the group there were others who were not quite as strong, but equally as persuasive in a nice way. That group had problems but it was mainly the make-up of the group, and I didn't know the kids that well at the beginning,

> and that was very close to the beginning. I didn't know how they interacted on a normal basis.

Another group struck oil but were very subdued about it because they did not want to alert the competition. Mrs. Melville said that the groups were becoming very devious about letting on when they struck oil.

Mrs. Melville described how initially she was frequently called upon to assist the groups:

> By the third lesson I was not called upon that often; the groups simply pressed on with the problem of finding oil. There was a lot of argument in one group, however, because they could not agree how to proceed. I had to put them back on track. One group were having difficulty plotting their graph and I went over to help. I was monitoring the group that was not doing well and went over to them to ensure that the students were able to capitalize on useful information that would soon lead them to oil. I did not want them to "blow it".

Finally a group found oil and much excitement was heard from their computer corner. They had found an oil trap and had to map exactly where it was. But they would have to wait until the next day to drill and finally hit oil and Mrs. Melville wanted to make sure they did not lose the spot.

Later, when OIL SEARCH was over, the class discussed what they thought about the simulation and what they learned about the techniques of oil drilling and the economics of the process. Mrs. Melville taped that discussion for us. The students made a number of points about the real world connections of the simulation and how unrealistic the price of oil was in the program.

New Games: New Rules. We asked her to construe her experience of teaching with computers:

> Playing around with computers was a legitimate element of what students were doing on the computers but time was a problem. The programs take longer to cover the same material and there is still all the other material in the curriculum to be covered.
>
> Machine problems are less of a difficulty than student behavioural problems. A program problem is easier to deal with than the more ambiguous student problem in working at the computer. You never know what the kids are going to do but the computer is pretty reliable.

Students helping other students is not a problem because students more readily accept help from peers when they are stuck on the computer they know who in the class can get them "unstuck." Without these knowledgeable students Mrs. Melville said that things would be more hectic:

> When the students are first starting on the program and you've got six computers going, the problem is they do not read the information. If they would read the information they wouldn't have that problem. If one of the other kids comes over and says: "Did you read that?", it's much more effective than if I say it.

Problems students have with computers are ambiguous and hectic. She has to think about them more than she would a simple mechanical failure. The unexpected problems, like students getting on with the program, makes things hectic; not the expected things, like the noise. As students become more familiar and confident with the computers things do become less hectic, but individual problems still arise. Why a student is in trouble still needs to be diagnosed, and doing that is difficult, she said.

Using computers exposes her to risks of unanticipated problems and ambiguous situations:

> They see the program [and say]: "That's great!". Put the disk in: "Tremendous, let's go!" It's a general problem and I think it gets better with maturity. It's

> a skill they can learn from computers. There is nothing wrong at the grade 9 level from expecting a kid to be able to follow instructions, provided they are well-stated. That can be a problem too. [Then] if you don't do it, you don't get anywhere. The [advanced students] are just as bad as the [less able ones]. It's got to a point where students are saying to each other: "Did you read it?"

She said that they have to learn the value of reading the material; although sometimes they have to be left to learn it for themselves. Some deliberately ignore instructions and "play" with the program. For example, in the farming game students grew potatoes in southern Ontario for ten years and made a lot of money, but making money was not the point of the exercise. They did not learn the geographical lesson and so were wasting their time on the computer, she said.

They also have to read the support documents carefully and find the information. Less able students do not do this. At first the groups were too big, now she has them working in pairs because, "they don't have the confidence with the machines that some of the other kids have." For some students, working in groups is a good thing. She mentioned a girl who was repeating the year:

> Now this girl did it last year, she's repeating. She knows the procedure and she has been good for them [the boys in her group] because they tend to be clowns. She's keeping them on track. It's a good responsibility for her. It's good for her self-confidence. She's guiding those two characters and they are getting somewhere.

Having a computer in her room creates situations which are ambiguous, take time to sort out, and press upon her. There is no quick way around these situations. She has to move into close contact with the students, find out what the problem is and sort

it out. She wishes that students would sort things out for themselves. Normally teachers can rely on students to do that just using textbooks and other carefully "scripted" materials. Not with computers.

Computer based learning, however, disrupts that assumption and de-rails routines based on student ability to follow instructions within a known framework. Moving out of the known framework, in which the significance of activity is unambiguous, to the computer framework is difficult. The students have difficulty because they do not read the instructions, but they also have difficulty because the learning activity itself takes place in an unfamiliar context. Well known routines which give significance to instructions do not exist, and students have to depend on the teacher to tell them in what direction to move. A new game with new rules takes time to understand.

Routines are very important to the teacher and the student. For the student they provide a context for action. For the teacher a basis for coping with large numbers of students without having to give individual tutorials. The routine is the context in which the teacher can exert influence - it is the context in which students can make sense of what the teacher is asking of them. Routines take the place of tutorials. A tutorial is a way of placing activity into context--of giving meaning to instructions. Tutorials which concentrate only on the cognitive demands of an activity, while ignoring the need to place activity in a meaningful context, do not work well.

Teachers provide a complex system of cues that help students stay on the right track. It is Mrs. Melville's teaching purpose

which provides the context for OIL SEARCH, not the program itself, and it is to her that students come in order to get guidance. Or to the students who had done it before--who knew what things signify.

Inquiry as Play. This is not to say that her purposes are not problematic. Mrs. Melville struggles with both fundamental ambiguities of computers, but especially the question: just what is this technology for? Take her attitude to "playing" with the computer.

She does not like the students to "play" with the computer. They are not seeing the computer in the same way she is. Their "play", which for some would be exactly what the students should be doing, is not what the computer is for. The computer is to help her teach the basic facts of the subject in a more interesting way. Yet she is disappointed that students did not go beyond the facts to larger issues, doing what is essentially "playful" -- something she does not encourage. What her routine approach "says" about what she believes is at odds with here espoused beliefs. She could learn from this.

Mrs. Melville has ritualized school work as a form of text "worship" in which the serious business of getting messages from the text help students become responsible through sustained and patient application. She makes sure that her students understand how serious the text is and they in turn knowing this apply themselves. The computer introduces a new element into the process which upsets the serious work at the text - the computer encourages "play" and inattention to text. It invites activities

which are "playfull" and which could, were she not so concerned about the text, support more free flowing discussion and inquiry learning. She says she wants to do that kind of teaching, but her belief in the importance of text is at odds with this move "playfull" approach.

The computer is not essential for reflective processes to occur, but it has the potential to stimulate them under the right conditions. Those right conditions involve a teacher to help students explore the significance of their computer experiences for their ideas about the world, and someone to help Mrs. Melville explore the assumptions of her professional practice, and her views about the spirit of inquiry.

Through the Looking Glass

The recovery of what is "said" in classroom through interpreting the routines we find there is what I mean by "thick description". It is an ethnographic process in which the significance of cultural performances are analysed. It is the journey through the looking glass. I take these routines, which we have only glimpsed here, as being significant processes of teaching - they can be called rituals without stretching the meaning of that word too far.

It is because microcomputers have great power to dislocate those rituals that they are so disconcerting to people who live in classrooms, and so interesting to the visitors. Both can learn from the disquiet that we have witnessed here when teachers work to assimilate new technologies into the order of their classroom -- into the rituals they conduct everyday.

It is through such dislocation that we can sense the true ethos of classrooms. It is through knowing what that ethos is that we can contemplate where tradition is taking us in education and what we think about the worth of that direction. The business of reform is not to abandon the tradition but to know it, judge it and improve it. "Thicker" description helps us do that by putting both teachers and outsiders "in the picture". Once there the journey outward through the looking glass to new traditions becomes possible.

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